Medical History and Physical Examination
NOAA Diving Exclusions and Qualifications
Absolute and Relative Contraindications for Occupational Diving

The examination of prospective divers should include the pertinent aspects of present and past history, review of systems and physical examination directed and designed to specifically detect those conditions that place a person in jeopardy for the following:

1) decompression illness

2) pulmonary over pressure accidents

3) loss of consciousness

4) inability to mentally or physically handle the in-water environment.

The obvious reasons why a person should not be allowed to dive are as follows:

- **$** Disorders that lead to altered consciousness
- **$** Disorders that inhibit the "natural evolution of Boyle's Law"
- **$** Disorders that may lead to erratic and irresponsible behavior.

Please Note: Recreational versus Occupational fitness to dive evaluations are done for a patient within the context of two distinct settings. The first, for the sport diver, is based solely on the medical safety considerations for the patient; where the patient assumes all liability for their own choices to dive or not. The second, for the occupational diver, is based upon the interests of both the organization and the diver. In the occupational setting, other considerations include: economic, medical-legal, and liability issues (as liability rests solely with the organization).

Absolute Contraindications

ENT

- **$** Inability to equalize pressure in the middle ear by auto-inflation. This may be due to a correctable problem such as polyps, nasal septal deviation or coryza in which case the diver can be reevaluated after correction of the problem
- **$** Perforation of the tympanic membrane. Until fully healed or successfully repaired with good Eustachian tube function, diving is contraindicated.
- **$** Open, non-healed perforation of the TM
- **$** Monomeric TM
- **$** Tympanoplasty, other than myringoplasty (Type I)
- **$** History of inner ear surgery
- **$** Status post laryngectomy or partial laryngectomy
- **$** History of vestibular decompression sickness
- **$** Radical mastoidectomy (posterior) involving the external canal is disqualifying. (Closed childhood OK)

- $ Meniere's disease is disqualifying, as well as surgical procedures designed to treat the condition
- $ Labyrinthitis
- $ Perilymphatic fistula
- $ Cholesteatoma is disqualifying
- $ Cerumen impactions - remove before allowing to dive
- $ Stenosis or atresia of the ear canal - disqualifying
- $ Facial paralysis secondary to barotrauma
- $ Tracheostomy, tracheostoma
- $ Incompetent larynx due to surgery (cannot close for valsalva maneuver)
- $ Laryngocoele
- $ Congenital or Acquired hearing loss

Neurological

- $ History of Seizure disorder: After head injury, disallow diving during that period of time that the diver is at risk for seizures
- $ Intracranial tumor or aneurysm
- $ History of TIA (transient ischemic attacks) or CVA (cerebral vascular accidents)
- $ History of spinal cord injury, disease or surgery with residual sequelae. This includes a history of having had Type II neurological DCS with permanent neurological deficits. A history of unexplained syncopal episodes, whether cardiovascular or neurogenic.
- $ Episodic loss of consciousness
- $ Recurring neurologic disorders (ie: multiple sclerosis)
- $ Peripheral neuropathies associated with weakness or significant pain or sensory loss, or that it is recurrent/progressive, is disqualifying

Heart

- $ Coronary artery disease
- $ Intracardiac shunts (particularly large right to left shunts), PFO
- $ Asymmetric Septal Hypertrophy: this can lead to sudden loss of consciousness.
- $ Valvular stenosis: Can lead to sudden loss of consciousness.
- $ Congestive heart failure
- $ Hypertension - Controlled can dive but drugs that limit exercise response (beta blockers) need to be evaluated. OK if person can reach 13 METS on the treadmill.
- $ Angina controlled with medications is disqualifying.
- $ Coronary spasm is disqualifying (can be cold or exercise induced).
- $ Silent ischemia
- $ Status post-op CABG with no symptoms and negative treadmill OK to dive if can reach 13 METS.
- $ Valvular Lesions:
    - Mitral regurgitation, aortic insufficiency with no left ventricular dysfunction can dive
    - Aortic and mitral stenosis are disqualified
    - Mitral valve prolapse with no symptoms such as chest pain, syncope, dyspnea can dive

- Intracardiac defects, right and left should be disqualifying.

$ Arrhythmias:
- Heart block that is unassociated with other cardiac dysfunction
- Primary-can dive after the usual exercise evaluation
- Higher grades of block are disqualifying
- Right bundle branch block can dive
- Left bundle branch block can dive with a normal thallium and angiogram test.
- Wolf-Parkinson-White syndrome is disqualified
- Supraventricular tachycardia can dive 6 months after the causes are removed

Lungs

$ Spontaneous pneumothorax; A history of previous spontaneous pneumothorax carries a high incidence of recurrence and the candidate must be advise against compressed-gas diving. A pneumothorax that occurs under water or in a chamber can become a "tension" pneumothorax on ascent and be immediately life-threatening as the pleural cavity expands because of Boyle's Law.

$ Traumatic or surgical pneumothoraces can be allowed to dive after appropriate clearance from a diving physician in consultation with a chest surgeon or pulmonary disease specialist.

$ Significant obstructive pulmonary disease

$ Air-containing pulmonary cysts or blebs which can trap air and lead to local pulmonary overpressure accident during decompression (ascent).

$ Asthma

Other Problems

$ Sickle cell disease or trait: There is the remote possibility that the sport diver will breathe a hypoxic mixture of gas or start the sickling process with exertion in cold water or with bubbles during decompression-thereby leading to sickling->hypoxia-> and a vicious cycle of more hypoxia and sickling.

$ Recent ocular surgery

$ Hematologic disorders including coagulopathies

$ Diabetes mellitus requiring hypoglycemic agent(s) for control

$ Pregnancy

Dental Considerations

$ Major oral surgery with prosthetic devices

$ Carious teeth

$ Osteomyelitis of the mandible

$ Osteoradionecrosis of the jaw

Psychiatric Considerations

$ Persons with a history of panic attacks

$ Claustrophobia

$ Suicidal ideation

- $ Psychosis
- $ Anxiety disorders
- $ Untreated depression
- $ Chronic substance abuse, including alcohol

Relative Contraindications

ENT

- $ Recurrent otitis externa or media
- $ Eustachian tube dysfunction
- $ History of Tympanic Membrane perforation
- $ Significant hearing loss in one ear
- $ Midface fracture
- $ Facial nerve paralysis
- $ Full mouth prosthetic devices
- $ Head and neck radiation
- $ Migraine headaches

Ophthalmic

- $ Lens implants can dive when completely healed (6 weeks).
- $ Radial Keratotomy, Lasik, or PRK can dive when fully healed (3 months). Officers must follow USCG Medical Manual procedures.
- $ Glaucoma can dive if vision is not affected

Neurologic

- $ Migraine: Those persons who have migraine with any of the following should not dive: Aura, impairment of one of the senses, nausea and vomiting or photophobia.
- $ Head injuries: Persons can be cleared for diving following head injuries if they have no history of: intracranial hemorrhage
- $ Brain contusion:
  - Unconsciousness lasting 24 hours or longer
  - Unconsciousness lasted 2-24 hours and the person has been seizure free for 2 years
  - Unconsciousness lasted less than 2 hours and the person has a normal neurological workup.
  - Person is neurologically normal one year after experiencing 3-4 weeks of amnesia.
  - Neurologically normal nine months after experiencing 2-3 weeks of amnesia.
  - Neurologically normal 6 months after amnesia for 1-2 weeks
  - Neurologically normal 6 weeks after momentary amnesia.
- $ Simple febrile seizures; Seizures accompanying febrile episodes below the age of 6 with no history of abnormal neurological exams, seizures of longer than 15 minutes duration or non-febrile seizures in family members.
- $ Ruptured disc without neurological or physical impairments. Successful disc surgery below

L1-L2 and uncomplicated, successful cervical disc surgery from an anterior approach after 3 months.

- **$** CNS (brain or spinal cord) decompression sickness with complete resolution of signs and symptoms within 24 hours.
- **$** Cerebral gas embolism with complete resolution of signs and symptoms within 24 hours assuming no complications from pulmonary considerations
- **$** Brain surgery (tumor or aneurysm)

Other Conditions

- **$ Cardiovascular System:**

  - Diagnoses potentially rendering the person incapable of performing the exertional requirements necessary to meet the needs of diving. Formal stress testing with a minimum criterion of 13 METS needed for qualification.

  - Implanted cardiac pacemakers and cardiac defibrillators

- **$ Pulmonary System:**

  - Patients with a thoracotomy can be certified for diving after thorough evaluation by a thoracic surgeon knowledgeable of diving medicine. Divers with pulmonary barotrauma may return to diving after no less than a three month wait and a certification from a diving physician that there is no air trapping.

- **$ Gastrointestinal System:**

  - Reflux disease and gastric outlet obstruction need to be evaluated prior to qualification.

  - A hernia that includes bowel is disqualifying until surgically repaired.

  - Esophageal diverticulae, severe reflux, hiatal hernias, achalasia, gas bloat syndrome, and gastric outlet obstruction are all disqualifying.

- **$ Musculoskeletal System:**

  - A person should not dive while fractures are healing and until acute inflammatory conditions of bone and joints subside.

  - Aseptic osteobaric necrosis is a contraindication.